RIVERS AND FLOODS

By MONTROSE W. HAYES

[In charge River and Flood Division]

During March 1933 floods occurred in the Grand, St. Joseph, and Sandusky rivers in the St. Lawrence Basin; in the South Atlantic and East Gulf of Mexico States; in the Ohio Valley; and in Arkansas and Texas. Some of the floods had not begun to recede at the end of March, and information concerning the others is not complete. A discussion of them will, therefore, appear in a later issue of the REVIEW.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, W. F. McDonald in charge]

NORTH ATLANTIC OCEAN

By W. F. McDONALD

Atmospheric pressure.—Pressures during March 1933 averaged somewhat below normal over most of the North Atlantic but the deficiency was only one tenth to two tenths of an inch. A slight excess of pressure prevailed over the region between Spain and the Canary Islands. In West Indian waters the averages were about normal. (See table 1.)

The pressure observations reported from ships at sea ranged from 30.46 to 28.55 inches. The highest reported occurred on the 14th between the Azores and Madeira, when the normal area of high pressure in that region had its greatest development of the month, as indicated by chart VIII. The lowest was observed on the 21st near 54° N., 34° W., close to the center of the deep LOW shown on chart IX.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, March 1933*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.76	-------	30.42	1	29.12	7
Reykjavik, Iceland	29.52	−0.02	30.20	1	28.81	7
Lerwick, Shetland Islands	29.75	+.05	30.29	21	29.01	17
Valencia, Ireland	29.76	−.14	30.46	27	28.82	17
Lisbon, Portugal	30.08	+.08	30.45	8	29.70	10
Madeira	30.13	+.12	30.30	15	29.87	22
Horta, Azores	30.06	−.12	30.40	14	29.58	1
Belle Isle, Newfoundland	29.79	−.04	30.32	27	28.82	11
Halifax, Nova Scotia	29.78	−.18	30.24	20	29.04	9
Nantucket	29.87	−.11	30.34	16	28.98	8
Hatteras	30.04	.00	30.44	16	29.42	8
Bermuda	30.04	−.10	30.28	13, 17	29.56	2
Turks Island	30.05	+.03	30.14	17	29.86	2
Key West	30.05	.00	30.20	5	29.72	20
New Orleans	30.05	+.01	30.28	5	29.48	19
Cape Gracias, Nicaragua	29.93	-------	30.00	24	29.78	20

NOTE.—All data based on a.m. observations only with departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—Gales were reported in March 1933 from an unusually large number of 5° squares in the North Atlantic but the storms were generally of less than average seasonal severity. Gales occurred in some parts of the ocean on all but 3 days of the month, and were reported south of the thirtieth parallel on 6 days. On many days, however, gales were quite local. Widespread storminess occurred in only a few brief periods, notably from the 1st to 3d, on the 7th and 8th; between the 16th and 20th, and on the 26th. Only a few gales exceeded force 10, the exceptions being as follows: force 11: off Nantucket on the 8th; near the Grand Banks on the 12th and 27th; in mid-ocean north of the 50th parallel on the 20th and 21st; and southwest of Ireland on the 17th. One ship, the Polish S.S. *Pulaski*, encountered on the 21st a wind estimated at force 12, in connection with the deepest storm of the month (as mentioned above and shown on chart IX).

During the first week, cyclonic conditions were dominant over the entire region between the east coast of the United States and western Europe. Later, however, slow-moving cyclones tended to pass at higher latitudes, and the normal belt of high pressure became established between the Azores and the West Indies. By the middle of the month, high pressures were well established between the twentieth and fortieth parallels, and cyclonic action had been crowded far northward towards Iceland and Greenland. This situation is illustrated on chart VIII. Thereafter, storminess increased somewhat, especially over the northeastern part of the ocean, culminating on the 20th and 21st in the deep low already referred to, and depicted on chart IX.

A succession of northern lows moved slowly eastward from the 21st until the close of the month. Occasionally during this period, trough-like extensions of cyclonic action disrupted the middle-latitude belt of high pressure, but in general the Atlantic HIGH was maintained with great stability after its establishment during the first half of the month.

Moderate gales on the 1st were reported from the Gulf of Mexico in connection with a mild "norther" that had its beginning at the end of February. There were southerly gales in that region on the 6th and 7th, in connection with a moderate disturbance that originated in the western part of the Gulf on the 5th.

The Caribbean trades.—The winds of the Caribbean region were somewhat weaker than usual, at no time exceeding force 6. Steadiness of direction also failed noticeably at times, and there was an unusual number of reports of southerly winds in the West Indies.

Fog.—Fog was observed on only 3 to 5 days over the western part of the main northern steamship routes, and on not more than 3 days between the Azores and the west coast of Europe. Fog frequency was much less than in February on the north coast of the Gulf of Mexico, but increased somewhat along the Atlantic coast from Chesapeake Bay southward to Jacksonville. A fog on the 29th was reported from midocean between Bermuda and the Azores, when fogs seldom occur.